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U.S.-JAPAN COMPETITION IN TELEPHONE EQUIPMENT

Summary

Two recent developments have refocused the transpacific spotlight on U.S.-Japan competition in telephone equipment, a high-profile trade issue in the mid-1980s. In late December American Telephone and Telegraph Co., in a fresh display of the aggressiveness it has shown since the breakup of the Bell System five years ago, accused the Japanese competition of selling small business telephone systems in this country for considerably less than at home. A month later Washington insiders revealed that Japan was not an immediate candidate for possible sanctions under the 1988 trade act for its limited purchases of telecommunications equipment from the United States, even though the law's tough provisions to improve foreign market access for American suppliers of these products were targeted implicitly at Japan.

There is a big gap in the U.S.-Japan trade statistics for telephone equipment and in the corresponding market share figures, but these numbers give just a partial picture of the competitive position of the two industries in each other's backyard. Japanese manufacturers are also-rans in the slow-growing U.S. markets for telephone company switches and large business systems, boxed in by AT&T, Northern Telecom Inc. and a few other entrenched players. Moreover, they are losing sales in the huge but flat American market for small office systems to lower-cost Korean and Taiwanese rivals. At the same time, deregulation of the telecommunications business in Japan and the realignment of the yen-dollar exchange rate are helping U.S. equipment makers enlarge their toehold in the Japanese market.

The Boom That Wasn't

Telecommunications industry analysts, manufacturers and vendors surveying the U.S. telephone equipment market in 1984 all came to the same conclusion: the market, whether for central office switches or customer premises (terminal) equipment, was primed to take off. The January 1983 deregulation of American Telephone and Telegraph Co.'s new CPE business practically guaranteed strong growth, they reasoned, since it offered the fast-expanding number of AT&T rivals added opportunities to replace the industry giant's huge installed base of office and home telephone equipment. What made robust growth a certainty in this market reading was the January 1984 breakup of AT&T. Divestiture raised the prospects of the Bell System operating companies becoming major marketing outlets for non-AT&T business telephone systems and residential phones as well as bigger buyers of central office equipment from non-AT&T sources.

Deregulation and divestiture were not the only things the market had going for it, according to 1984's conventional wisdom. There also was pent-up demand. The recession of the early 1980s and high interest rates had forced the 22 Bell System operating companies and the 1,500 or so independent operating companies to cut back their budgets for central office switches and had put a damper on corporate orders for private branch exchanges (office switchboards that provide pooled access to groups of external lines from a combination of single-line and multiline telephone sets) and key telephone systems (multiline telephones that allow pushbutton selection of a specific line from a number of central office lines). Moreover, analysts and suppliers expected technology to drive the market as telephone companies replaced their analog switches with digital equipment to improve performance, reduce costs and provide new or enhanced customer services and as businesses installed digital PBXs with their simultaneous voice/data transmission capabilities.

Five years later corporate planners and industry trackers readily acknowledge that their projections were way off target. What was supposed to be a boom amounted to nothing more than a pickup in business in 1984 and 1985, followed by a return to slow or no growth. This misreading of market forces has no single, all-purpose explanation. But at least for central office switches, the reason for the downturn in shipments in the late 1980s is straightforward: telephone companies, which planned to replace 90 percent of their local and long-distance analog switches with digital systems by the end of the 1980s, had completed the bulk of the conversion by 1986.

The reasons office equipment shipments have not matched projections are more complex. One obvious factor is the product replacement cycle. Sales and leases of both key systems and PBXs were fairly strong in the late 1970s and the first half of the 1980s as small businesses replaced their AT&T-made 1A2 electromechanical key systems with electronic systems and large companies moved up from analog PBXs to digital products. Whether they took delivery of small systems or big ones, most businesses acquired equipment that had more capacity and features than they needed in the short run. That gave expanding companies the flexibility to upgrade their systems through add-on products or software

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changes rather than replace them -- a clear plus for users but an equally apparent drawback for PBX and key system suppliers trying to generate sales in the second half of the 1980s.

Shipments also have been hamstrung to some extent by a mismatch between what firms with old equipment need in a phone system and the products on the market. Companies employing 10 or fewer people make up a big part of the customer pool. They are looking for low-cost, no-frills, small-configuration key systems, yet many of the models made by American and Japanese suppliers do not fit these requirements. In the end, therefore, a significant number of potential customers decide to keep their 1A2 key systems or the first upgrades of this equipment, AT&T's ComKey 416 or similar basic products manufactured years ago by GTE Corp. and ITT Corp.

The same problem exists in the PBX market. For many midsized and large businesses, perhaps a majority, the heavily touted high-speed data transmission capabilities of digital PBXs still are of little immediate interest. Their primary requirement is voice communications, which can be handled by existing analog switches. At the same time, competitive alternatives to digital PBXs are available for those companies sending and receiving large volumes of data. In addition, digital switches, billed by manufacturers as the hub of the automated office of the future, have lost some of their luster because of repeated delays in implementing ISDN (integrated services digital network) -- a network that, at least on paper, will combine the transmission of voice, data, graphics and images.

In hindsight it is easy to see how suppliers and analysts caught up with deregulation and divestiture missed these looming constraints. What no one could have anticipated, however, was the resurgence of Centrex -- shorthand for telecommunications services provided to business customers by telephone companies through their local central office switches -- as an alternative to PBXs and key systems. Ignored by AT&T in the years before divestiture, Centrex had lost considerable ground to increasingly feature-laden CPE. However, the seven regional Bell holding companies, which kept the installed Centrex base after the breakup, saw the chance to turn this service into a growing source of revenue by providing the same advanced functions offered by PBXs and key systems and making it price competitive with purchased or leased equipment. This strategy is paying off for the phone companies, but their gain has come at the expense of manufacturers.

AT&T Defies Rivals

AT&T's rivals and industry analysts proved to be no better judges of how AT&T would fare in a deregulated market than they were sales forecasters. Despite some mistakes along the way, AT&T has turned out to be a stronger competitor than most people anticipated. It has shortened its previously long product development cycle so that new equipment and enhancements to existing models are arriving on the market closer to the introduction of competing products. The company also has managed to bring production costs in line with the competition's; demonstrated a willingness to cut prices to generate business; learned how to market through multiple distribution channels; and capitalized on its reputation for fast service and maintenance. As a result, the drop in AT&T's market share, expected to be steep and across-the-board, went no farther in central office switches and PBXs than a limited loss in 1984.

Although five years behind archrival Northern Telecom Inc. in installing its first digital central office switch, AT&T quickly regained the network switch market share it had lost in the first part of the 1980s and now tops the subsidiary of Canada's Northern Telecom Ltd. in the number of lines shipped each year. Of course, the market leader has several things going for it, including close ties with the Bell operating companies, still the primary customers for this sophisticated technology, and the resources to fund the tremendous costs of hardware development and adequate production capacity. But these pluses do not translate into marketing advantages if the company is unable to meet constant BOC demands for new software-intensive features at attractive prices -- a new AT&T strength.

AT&T has fought back as well in PBXs. In the late 1970s rivals -- including Northern Telecom, Rolm Corp., Mitel Corp., GTE, NEC Corp. and Fujitsu, Ltd. -- mounted a successful attack on AT&T's then dominant market position, in part by offering business customers digital systems when the leader's only PBX was an analog product. The competition also was an unintended beneficiary of AT&T's 1979 migration strategy, designed to induce the huge number of users of its electromechanical PBX equipment to trade up to the analog Dimension by hiking lease rates on the old products.

The low point for AT&T came in 1984 when Northern Telecom shipped more PBX lines than it did, but that also was the turning point for the company. Armed with the new midrange System 75 digital PBX and the previously introduced System 85 digital PBX for large installations, AT&T went on the offensive, cutting list prices to prevent additional erosion in its installed base and to win new customers. That tactic shored up AT&T's share in the middle and the high end of the PBX market. A similar strategy, designed around the System 25 digital model unveiled in mid-1986, produced the same results at the low end.

AT&T built on this foundation when PBX market growth slowed to a crawl in the second half of the 1980s by adopting even more aggressive pricing policies, particularly for key corporate accounts. By then the company was back in first place. Maintaining that position, though, has been expensive -- not just for AT&T but also for other PBX suppliers. Profit margins in the last two years have been paper-thin at best and generally nonexistent as everyone has cut prices in the scramble for what little replacement business there is.

If AT&T has stumbled anywhere in the postderegulation, postdivestiture period, it is in the key systems business. But more was at risk here, given the massive size of the market -- roughly 4 million units in use in 1984 -- and AT&T's 60 percent share of the installed base. Then, too, the conditions of competition were even stiffer in key systems than in PBXs and network switches. For starters, there were more rivals, from established players like ITT, TIE Communications Inc. (handling equipment made by Nitsuko Corp.), Toshiba Corp., Iwatsu Electric Co., Ltd. and NEC to a host of newcomers, domestic as well as foreign, lured into the business by what they thought was a market up for grabs. Equally important, shipment growth was flattening quickly after the fairly strong gains of the previous seven years.

AT&T has done remarkably well in key systems, all things considered. The company still is the market leader, although, admittedly, its share of annual shipments, already declining in the growth years, has continued to slip. AT&T again was later than its rivals in bringing new products and enhancements to

the market, but the Merlin family of analog key systems -- introduced in late 1983 and expanded in the spring of 1987 with the addition of a new low-end model and the digital Merlin II -- and the Spirit analog key system, also announced in April 1987, have helped the firm retain most of its customers. What has made the biggest difference in the highly price-sensitive key systems market, however, is AT&T's willingness to play pricing hardball to win business -- even when that means miserable margins.

AT&T's unexpected success in maintaining the top position in central office switches, PBXs and key systems is not the only source of frustration for suppliers convinced that deregulation and divestiture would provide their big market break. They also have been surprised by the staying power of AT&T's main competitors. AT&T and Northern Telecom have locked up most of the market for network switches, forcing Stromberg-Carlson Corp. (now a unit of Britain's GEC Plessey Telecommunications Ltd.), Siemens AG of West Germany, LM Ericsson of Sweden and NEC to fight it out for third place. In PBXs the scorecard reads the same way it did in the early 1980s -- AT&T, Northern Telecom, Rolm, Mitel and NEC. Moreover, their combined 75 percent or so market share has varied little over the years. And while the order has changed, the lineup in key systems still is much the same, including ITT, TIE, Toshiba and Iwatsu plus AT&T.

Perhaps the biggest surprise of all is the failure of Japanese manufacturers to make substantial market inroads. Many analysts had pegged the Japanese competition as the main beneficiary of deregulation and divestiture. After all, NEC, Fujitsu, Hitachi, Ltd. and Oki Electric Industry Co., Ltd. bring to the telephone equipment business their related expertise in computers and semiconductors. They have extensive research and production experience in telecommunications equipment as the dominant suppliers to Nippon Telegraph and Telephone Corp. Moreover, these four firms and companies like Toshiba, Nitsuko and Iwatsu had long-established U.S. distribution channels, state-of-the-art products on the market, a record of introducing enhancements and a reputation for aggressive pricing.

Despite these considerable strengths, Japanese suppliers are also-rans in the American CPE business and a negligible factor in network switches. Their efforts to build share in office systems, modestly successful in the up market of the late 1970s and the first half of the 1980s, stalled in 1986 with the onset of slow-growing or flat demand and the yen's rapid appreciation. Since then Japanese makers have been kept on the defensive. NEC, first among the Japanese companies competing in the U.S. PBX market, never accounted for more than 10 percent of annual shipments. Now its PBX market share is estimated to be one or two points lower; rivals Fujitsu and Hitachi are stuck in the low single-digit range. In key systems, where Japanese competitors collectively have a larger market stake, Toshiba, Nitsuko, Iwatsu and other suppliers are under attack from lower-cost Korean and Taiwanese manufacturers.

Shakeout in the Market?

The rampant price-cutting in the business systems market and the limited opportunities for third-tier makers of central office switches have revived talk of a shakeout. Industry observers and manufacturers alike had warned in the early 1980s that the marketplace could not and would not support the expanding list of PBX and key systems suppliers or the 10 contenders in network

switches. Companies like TRW Inc., Rockwell International Corp., General Dynamics Corp. and Datapoint Corp., which had moved into the CPE business from other fields, did drop out in 1983, but the major retrenchment everyone then expected never materialized.

It could now -- although the shakeout might not follow the script prepared by analysts. Instead of the predicted mass exodus of latecomers, the market's victims could include more veterans like ITT and GTE. In February 1986 ITT pulled out of the U.S. central office switch market, and at the end of that year the firm merged its worldwide telecommunications activities with those of France's Compagnie Generale d'Electr[illegible]. For its part, GTE, once a full-line manufacturer, completed its exit from the telephone equipment industry late last year. The inventor of the automated telephone switchboard transferred its network switch operations to a new company formed by it and century-long nemesis AT&T. This move was preceded by the March 198[illegible] sale of an 80 percent stake in GTE's PBX business to Fujitsu and the Japanese company's buyout of its partner in September 1988.

The transaction that perhaps best captures the turmoil in the telephone equipment market is International Business Machines Corp.'s pending spin-off of Rolm, the longtime number-three player in PBXs. In mid-December the computer giant agreed to sell Rolm's development and manufacturing operations to Siemens and to form an equally owned joint venture with the West German company to market the Rolm line, which has lost money ever since IBM took it over in late 1984. If a heavyweight like IBM cannot survive the market's pressures, analysts wondered, who can?

To improve the odds, major competitors are restructuring. In December Northern Telecom announced a corporate downsizing plan for its North American operations that will cost as much as $200 million. Earlier in the year the company had laid off people at its American central office switch plant and started consolidating U.S. production of its PBXs. Similarly, Mitel, the market leader in low-end PBXs, closed its domestic PBX plant in March 1988 and reduced its North American workforce. AT&T has gone through the same process over the last five years, transferring production of telephone units to the Far East, consolidating U.S. output of office systems and network switches and cutting domestic manufacturing employment. Now the industry leader is threatening to take restructuring one step farther. It says it will be forced to exit part or all of the $4 billion U.S. market for key systems and low-end PBXs if Asian competitors "continue to flood the market with unfairly priced products."

AT&T calculates that manufacturers in Japan, Korea and Taiwan boosted their combined share of the American market for small office systems -- equipment like its Merlin and Spirit key systems and the System 25 PBX -- from roughly 40 percent in 1985 to more than 55 percent in 1988's first half. These gains, the company charged in a complaint filed with the government at the end of last year, were the direct result of a simple sales strategy: dumping. Japanese suppliers allegedly added two points to their 1985 tally of 36 percent by selling small systems here for 80 percent less on average in the April-June 1988 period than they charged at home. The dumping margins on products from Korea were not as huge, averaging about 50 percent, but the supposedly unfair pricing practices of Korean producers yielded bigger dividends. In the space of just three-and-a-half years, AT&T estimated, the Koreans turned a 3.7 percent market stake into a 16.4 percent holding.

AT&T's attempt to blame foreign rivals for its slipping leadership position in small office systems is dismissed by spokesmen for the eight Japanese manufacturers named in the dumping petition (see JEI Report No. 1B, January 6, 1989). They maintain that changing market conditions are the cause of the American industry's general business difficulties. AT&T's specific problems in key systems and PBXs, corporate executives add, are self-inflicted, the result of delayed product introductions and marketing errors. In any case, it is argued, suppliers in Japan are not a threat to American makers because the strong yen is curtailing U.S. imports of Japanese-made small business equipment.

Already concerned about their sales prospects in the American market, Japan's telephone equipment manufacturers worry that Washington could deliver a one-two trade punch. By February 22 U.S. Trade Representative Carla Hills must tell the president and the Congress what countries have been targeted for negotiations to improve market opportunities for American suppliers of telecommunications equipment and services and for sanctions if these discussions fail. Her predecessor, Clayton Yeutter, completed the necessary background investigation of foreign telecommunications trade barriers before he left office, reportedly singling out the European Community and South Korea as the best candidates for market access talks. Word of these choices was greeted with a sigh of relief in Japan but frustration on Capitol Hill and in some U.S. business circles since Japan was the primary target of the tough telecommunications provisions of the 1988 Omnibus Trade and Competitiveness Act.

Whatever angry congressmen and American corporate executives might say, the apparent omission of Japan was understandable from the Reagan administration's perspective since it had invested a considerable amount of political capital in 1985 to make sure that Japan's newly deregulated domestic telecommunications market would be completely open to foreign competitors. Telecommunications equipment and services were the centerpiece of the year-long market-oriented, sector-selective talks, the awkward name for the White House's in-depth negotiating approach to sectoral access problems in Japan. Although often acrimonious, these discussions produced results. U.S. trade policymakers, in fact, admitted that the telecommunications talks had succeeded beyond all expectations. Japan also has received generally high marks from government officials for implementing its pledges. Moreover, U.S. exports of telecommunications equipment to Japan, while not as large as officials in either Tokyo or Washington would like to see, are expanding -- and expanding in real terms.

Despite what Washington sources say the new Bush administration is going to do on telecommunications market access reciprocity, Japan is not completely off the hook. USTR Hills still could add its name to the list of countries targeted for priority negotiations. In addition, the White House has the leeway to retaliate against Japan at some point if there is evidence that Tokyo is not living up to its MOSS commitments. For the moment, though, the odds of a double blow to Japanese telecommunications equipment makers on trade appear slim.

For further information, contact Susan MacKnight.

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The views expressed in this report are those of the author and do not necessarily represent those of the Japan Economic Institute.

APPENDIX

Table 1: U.S. Market for Telephone Terminal and Switching Equipment, 1983-87

(in thousands of dollars)

	1983	1984	1985	1986	1987
Total Shipments	$8,321,641	$10,813,180	$12,242,262	$10,828,138	$11,511,556
Total Exports	670,879	643,489	713,820	716,893	799,200
Total Imports	1,501,787	1,953,655	2,355,197	2,371,402	2,632,814
Trade Balance	-830,908	-1,310,166	-1,641,377	-1,654,509	-1,833,614
Exports to Japan	14,681	22,614	38,889	72,250	62,465
Imports from Japan	483,298	901,911	927,523	917,118	855,792
Trade Balance	-468,617	-879,297	-888,634	-844,868	-793,327
Apparent Supply	9,152,549	12,123,346	13,883,639	12,482,647	13,345,170
Total Exports as Percent of Shipments	8.1%	6.0%	5.8%	6.6%	6.9%
Exports to Japan as Percent of Shipments	0.2%	0.2%	0.3%	0.7%	0.5%
Total Imports as Percent of Apparent Supply	16.4%	16.1%	17.0%	19.0%	19.7%
Imports from Japan as Percent of Apparent Supply	5.3%	7.4%	6.7%	7.3%	6.4%

Source: Derived from following tables.

Table 2: U.S. Shipments of Telephone Terminal and Switching Equipment, 1983-87

(in thousands of dollars)

	1983	1984	1985	1986	1987(p)
Telephone Switching and Switchboard Equipment	$4,650,697	$5,871,213	$7,714,302	$7,180,020	$7,480,541
Private Branch Exchange Equipment	1,050,100	1,603,703	1,720,804	855,911	1,221,964
Central Office Switching Equipment	2,218,543	2,856,934	4,332,824	4,472,250	4,442,464
Local Switching	1,872,374	2,459,164	3,687,686	3,715,251	3,933,960
Toll Switching	346,169	397,770	645,138	756,999	508,504
Other Telephone Switching and Switchboard Equipment and Parts*	1,382,054	1,410,576	1,660,674	1,851,859	1,816,113
Telephone Sets	831,153	846,663	1,218,575	790,577	1,003,053
Touch Tone	376,195	581,263	983,941	293,799	398,156
Rotary	126,650	57,835	40,930	19,049	11,386
Cordless and Other (call directors, key sets and special purpose)	328,308	207,565	193,704	477,729	593,511
Telephone Answering Devices and Telephone Key Systems				541,616	571,630
Other Telephone and Telegraph Equipment (excl. carrier line equipment, modems and voice frequency equipment) and Parts*	2,839,791	4,095,304	3,309,385	2,315,925	2,456,332
Total Shipments	8,321,641	10,813,180	12,242,262	10,828,138	11,511,556

*Excludes parts in 1983 and 1984.

Source: U.S. Department of Commerce, Bureau of the Census, Current Industrial Reports: Selected Electronic and Associated Products, Including Telephone and Telegraph Apparatus (MA 36N) for 1983 and Communication Equipment, Including Telephone, Telegraph and Other Electronic Systems and Equipment (MA 36P) for 1984-87.

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Table 3A: Total U.S. Exports of Telephone Terminal and Switching Equipment, 1983-88

(in thousands of dollars, f.a.s. value)

	1983	1984	1985	1986	1987	January-October 1987	January-October 1988
Telephone Switching and Switchboard Equipment and Parts	$439,907	$399,234	$362,673	$394,342	$411,677	$313,062	$449,017
Telephone Instruments	27,714	36,996	37,322	37,543	65,873	45,820	110,146
Other Telephone Apparatus and Instruments and Parts	203,258	207,259	313,825	285,008	321,650	243,504	375,822
Total Exports	670,879	643,489	713,820	716,893	799,200	602,387	934,985

Table 3B: U.S. Exports of Telephone Terminal and Switching Equipment to Japan, 1983-88

(in thousands of dollars, f.a.s. value)

	1983	1984	1985	1986	1987	January-October 1987	January-October 1988
Telephone Switching and Switchboard Equipment and Parts	$4,474	$7,764	$15,132	$45,433	$35,178	$17,980	$45,873
Telephone Instruments	835	3,396	4,363	2,338	8,662	6,479	6,415
Other Telephone Apparatus and Instruments and Parts	9,372	11,454	19,394	24,479	18,625	14,996	14,040
Exports to Japan	14,681	22,614	38,889	72,250	62,465	39,455	66,327

Source: U.S. Department of Commerce, Bureau of the Census, U.S. Exports: Schedule E Commodity by Country (FT 410).

Table 4A: Total U.S. Imports of Telephone Terminal and Switching Equipment, 1983-88

(in thousands of dollars, Customs value)

	1983	1984	1985	1986	1987	January-October 1987	January-October 1988
Telephone Switching and Switchboard Equipment	$276,089	$554,002	$518,931	$401,356	$416,230	$344,704	$357,613
Key Telephone Switching Apparatus				79,597	76,838	62,047	64,526
Other Telephone Switching Apparatus	276,089	554,002	518,931	54,963	41,307	35,571	23,731
Parts of Telephone Switching Apparatus				266,796	298,085	247,086	269,356
Telephone Sets	783,865	742,379	649,891	1,154,262	1,301,199	1,079,565	1,042,520
Standard Single-Line Telephone Sets				205,847	142,179	119,002	106,266
Single-Line Telephone Sets with Special Features	415,058	485,778	483,901	348,107	435,495	369,366	362,403
Multiline Telephone Sets				209,415	233,724	191,889	171,061
Parts of Telephone Sets and Instruments				169,069	138,529	112,021	90,107
Cordless Telephone Sets	368,807	256,601	165,990	221,824	351,272	287,287	312,683
Answering Machines and Parts	112,545	180,363	194,003	272,662	277,446	225,357	299,257
Intercom Systems	6,571	7,325	10,639	8,726	13,077	11,254	6,424
Other Telephone Terminal Equipment				67,326	110,597	88,414	136,224
Parts of Other Telephone Terminal Equipment	322,717	469,586	345,099	145,292	106,243	94,275	58,061
Other Telephone Apparatus and Parts			318,317	321,778	408,022	338,943	469,461
Total Imports	1,501,787	1,953,655	2,355,197	2,371,402	2,632,814	2,182,512	2,369,560

Table 4B: U.S. Imports of Telephone Terminal and Switching Equipment from Japan, 1983-88

(in thousands of dollars, Customs value)

	1983	1984	1985	1986	1987	January-October 1987	January-October 1988
Telephone Switching and Switchboard Equipment	$145,437	$317,337	$201,942	$160,567	$121,804	$112,240	$73,421
Key Telephone Switching Apparatus				36,516	21,853	19,729	16,305
Other Telephone Switching Apparatus	145,437	317,337	201,942	24,399	21,152	19,746	10,708
Parts of Telephone Switching Apparatus				99,652	78,799	72,765	46,408
Telephone Sets	184,568	242,886	209,273	401,594	395,077	328,403	277,662
Standard Single-Line Telephone Sets				36,628	16,718	13,476	2,259
Single-Line Telephone Sets with Special Features	110,137	182,271	172,386	86,004	101,752	87,168	88,788
Multiline Telephone Sets				98,325	102,657	88,785	59,110
Parts of Telephone Sets and Instruments				140,699	111,353	89,469	64,065
Cordless Telephone Sets	74,431	60,615	36,887	39,938	62,597	49,505	63,440
Answering Machines and Parts	68,529	116,891	95,274	118,045	81,339	66,740	55,900
Intercom Systems	2,982	3,224	4,832	4,458	6,796	6,398	1,613
Other Telephone Terminal Equipment				29,376	52,679	47,609	52,820
Parts of Other Telephone Terminal Equipment	81,782	221,573	230,354	89,609	54,832	50,921	16,016
Other Telephone Apparatus and Parts			185,848	113,469	143,265	129,441	116,377
Imports from Japan	483,298	901,911	927,523	917,118	855,792	741,752	593,809

Source: U.S. Department of Commerce, Bureau of the Census, U.S. Imports for Consumption and General Imports (FT 246).

C

Table 5: Japan's Market for Telephone Terminal and Switching Equipment, 1983-87*

(in thousands of dollars)

	1983	1984	1985	1986	1987
Total Production	$2,315,637	$2,748,531	$2,779,484	$4,020,164	$4,862,493
Total Exports	539,557	624,172	562,441	705,462	764,234
Total Imports	14,694	18,882	28,115	38,826	84,391
Trade Balance	524,863	605,290	534,326	666,636	679,843
Exports to the United States	212,672	365,790	260,791	296,049	292,000
Imports from the United States	6,485	11,299	16,665	17,911	38,836
Trade Balance	206,187	354,491	244,126	278,138	253,164
Apparent Supply	1,790,774	2,143,241	2,245,158	3,353,528	4,182,650
Total Exports as Percent of Production	23.3%	22.7%	20.2%	17.5%	15.7%
Exports to the United States as Percent of Production	9.2%	13.3%	9.4%	7.4%	6.0%
Total Imports as Percent of Apparent Supply	0.8%	0.9%	1.3%	1.2%	2.0%
Imports from the United States as Percent of Apparent Supply	0.4%	0.5%	0.7%	0.5%	0.9%

*Excludes parts.

Source: Derived from following tables.

Table 6: Japan's Production of Telephone Terminal and Switching Equipment, 1983-87*

(in thousands of dollars**)

	1983	1984	1985	1986	1987
Telephone Switching and Switchboard Equipment	$1,087,116	$1,170,596	$1,245,141	$1,938 043	$2,713,717
Central Office Switching Equipment	792,607	912,277	732,816	1,072,116	1,662,963
Private Branch Exchange Equipment			345,221	605,798	716,503
Other Telephone Switching and Switchboard Equipment	294,510	258,319	167,104	260,129	334,251
Telephone Sets	235,220	305,418	420,479	605,305	769,324
Standard Single-Line Telephone Sets	235,220	305,418	214,123	226,792	219,932
Single-Line Telephone Sets with Special Features			99,128	172,164	272,781
Other Telephone Sets			107,231	206,349	276,604
Key Telephone Systems	770,161	973,817	858,351	1,081,243	955,351
Answering Machines	46,579	82,305	88,006	189,770	189,111
Other Telephone Attachments	82,708	122,377	56,104	70,069	88,738
Intercom Systems	52,162	49,646	52,834	69,915	75,705
Other Telephone Equipment	41,691	44,371	58,569	65,820	70,548
Total Production	2,315,637	2,748,531	2,779,484	4,020,164	4,862,493

*Excludes parts.
**The following average annual exchange rates were used to convert the yen production figures: 1983, Y237.51; 1984, Y237.52; 1985, Y238.54; 1986, Y168.52; and 1987, Y144.64.

Source: Japan, Ministry of International Trade and Industry, Yearbook of Machinery Statistics.

Table 7A: Japan's Total Exports of Telephone Terminal and Switching Equipment, 1983-88

(in thousands of dollars*, f.o.b. value)

	1983	1984	1985	1986	1987	January-October 1987	January-October 1988**
Key Telephone Systems	$66,357	$70,052	$69,129	$68,860	$79,082	$69,364	$71,877
Electronic Telephone Switchboards and Exchanges	208,178	158,770	179,158	276,459	329,153	279,519	341,865
Other Telephone Switchboards and Exchanges	57,617	21,094	16,103	17,330	7,153	7,013	
Desk and Wall Telephone Instruments	75,422	165,278	114,669	155,025	103,688	87,488	77,736
Other Telephone Instruments	94,618	175,749	157,355	161,665	218,949	186,786	287,519
Intercom Systems	16,518	16,610	15,858	18,562	18,947	15,566	14,948
Other Telephone Apparatus	20,846	16,619	10,168	7,561	7,263	6,336	6,149
Parts	347,343	599,764	449,631	586,137	563,663	467,334	555,096
Total Exports	886,900	1,223,936	1,012,072	1,291,599	1,327,897	1,119,407	1,355,190

Table 7B: Japan's Exports of Telephone Terminal and Switching Equipment to the United States, 1983-88

(in thousands of dollars*, f.o.b. value)

	1983	1984	1985	1986	1987	January-October 1987	January-October 1988**
Key Telephone Systems	$30,634	$26,871	$28,053	$30,440	$34,054	$31,158	$16,587
Electronic Telephone Switchboards and Exchanges	36,878	37,908	18,098	23,744	21,464	16,798	24,917
Other Telephone Switchboards and Exchanges	10,332	10,194	941	0	14	14	
Desk and Wall Telephone Instruments	46,293	127,347	80,478	112,491	51,955	45,900	23,327
Other Telephone Instruments	71,121	149,248	123,452	122,021	176,342	153,378	197,708
Intercom Systems	3,724	4,389	5,129	5,147	—5,869	5,303	4,064
Other Telephone Apparatus	13,691	9,833	4,639	2,206	2,395	2,261	1,458
Parts	171,358	420,953	266,346	309,348	279,809	234,287	239,544
Exports to the United States	384,030	786,743	527,137	605,397	571,902	489,099	507,604

*The following average annual exchanges rates were used to convert the yen export figures: 1983, Y237.52; 1984, Y236.95; 1985, Y240.29; 1986, Y169.99; 1987, Y145.90; January-October 1987, Y148.03; and January-October 1988, Y128.99

**In 1988 Japan switched its classification system from the Customs Cooperation Council Nomenclature to the Harmonized Commodity Description and Coding System. Therefore, the product categories for 1988 do not always match exactly those for earlier years.

Source: Japan, Ministry of Finance, Japan Exports and Imports: Commodity by Country.

Table 7A: Japan's Total Imports of Telephone Terminal and Switching Equipment, 1983-88

(in thousands of dollars*, c.i.f. value)

	1983	1984	1985	1986	1987	January-October 1987	January-October 1988**
Electronic Telephone Switchboards and Exchanges	$8,745	$7,404	$10,242	$18,507	$38,827	$34,172	$61,960
Other Telephone Switchboards and Exchanges	5	44	125	0	0	0	
Other Telephone Apparatus	5,943	11,433	17,747	20,319	45,564	34,786	52,522
Parts	34,332	46,860	63,608	83,210	101,570	80,430	116,767
Total Imports	49,026	65,742	91,723	122,036	185,961	149,388	231,249

Table 7B: Japan's Imports of Telephone Terminal and Switching Equipment from the United States, 1983-88

(in thousands of dollars* c.i.f. value)

	1983	1984	1985	1986	1987	January-October 1987	January-October 1988**
Electronic Telephone Switchboards and Exchanges	$5,134	$6,927	$9,813	$14,799	$33,612	$30,136	$57,646
Other Telephone Switchboards and Exchanges	2	7	4	0	0	0	
Other Telephone Apparatus	1,348	4,365	6,848	3,112	5,224	4,474	4,272
Parts	30,169	43,253	59,267	78,372	87,435	68,612	88,874
Imports from the United States	36,654	54,552	75,932	96,283	126,271	103,222	150,792

*The following average annual exchanges rates were used to convert the yen export figures: 1983, Y237.59; 1984, Y236.91; 1985, Y240.17; 1986, Y170.08; 1987, Y146.01; January-October 1987, Y148.09; and January-October 1988, Y129.02

**In 1988 Japan switched its classification system from the Customs Cooperation Council Nomenclature to the Harmonized Commodity Description and Coding System. Therefore, the product categories for 1988 do not always match exactly those for earlier years.

Source: Japan, Ministry of Finance, Japan Exports and Imports: Commodity by Country.